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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/820,114

03/28/2001

Ching-Wei Chang

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06/29/2005

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EXAMINER

THOMPSON, JAMES A

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/820,114

Applicant(s)

CHANG, CHING-WEI

Examiner

James A. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 February 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 28 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 08 February 2005 have been fully considered but they are not persuasive.

**Regarding first page of "Remarks" section, lines 9-14:**

Since the entire abstract is, as Applicant admits, a restatement of the broadest claim, the entire abstract is legal claim language and thus does not comply with the formal requirements of the Office regarding abstracts. Further, since said abstract is in a legal claim language form, the abstract is also clearly not in narrative form, which is another requirement of the Office for a proper abstract. Additionally, Applicant is advised that the "canned MPEP language" recites formal matters that are required by the USPTO for all applications before any patent may issue, assuming of course that there are allowed claims.

**Regarding first page of "Remarks" section, line 15 to end of "Remarks" section:** Applicant's arguments are directed to the amendments to the claims and not the claims as filed before the previous office action, said office action dated 25 October 2004.

### *Specification*

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in

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an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure is objected to because the abstract is written in legal claim language. The abstract needs to be written in narrative form. Correction is required. See MPEP § 608.01(b).

#### ***Notice Regarding Claims***

3. Applicant is advised that should claim 3 be found allowable, claim 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the

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other as being a substantial duplicate of the allowed claim.  
See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (US Patent 6,172,769 B1) in view of Crean (US Patent 6,643,032 B1).

**Regarding claim 1:** Rao discloses selecting an image which has been halftoned (column 4, lines 60-66 of Rao). The image I (figure 2(202) of Rao) which is to be halftoned (column 4, lines 60-66 of Rao) must be selected in order to be input.

Rao further discloses determining a number of tone levels (2<sup>B</sup>) required for each pixel of the selected halftoned image (column 5, lines 56-59 of Rao); arranging the number of tone levels in a set of tone levels (column 6, lines 25-30 of Rao); and identifying a high-frequency halftone cell size (column 5, lines 45-50 and column 6, lines 17-19 of Rao). Since the halftone cell size is defined using a minimal size to yield the maximum number of gray levels (column 6, lines 17-19 of Rao), then said halftone cell size is clearly a "high-frequency" cell size.

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Rao further discloses scanning the selected halftoned image (column 4, lines 60-62 and column 5, lines 56-59 of Rao) to produce a second generation halftoned image (column 6, lines 17-23 and lines 36-37 of Rao); reproducing, for each pixel in the second generation halftoned image, a pixel tone level (column 6, lines 22-25 and lines 36-37 of Rao); and arranging a dot growth pattern evenly across the second generation halftoned image (column 6, lines 23-30 and lines 43-49 of Rao). In order to halftone a grayscale image (column 6, lines 43-49 of Rao), it is inherent that some form of dot pattern must be arranged and grown in order to represent the grayscale image as halftone dots. Furthermore, by selecting a dot growth pattern for a halftone cell of the second generation halftoned image that eliminates asymmetric effects (column 6, lines 23-30 of Rao), the dot growth pattern is thus arranged evenly.

Rao does not disclose expressly selecting, from the set of tone levels, a tone level closest to the pixel tone level of each pixel in the second generation halftoned image to minimize noise generated during scanning without constructing a new halftone center.

Crean discloses selecting, from the set of tone levels (figure 6A and column 4, lines 44-50 of Crean), a tone level closest to the pixel tone level of each pixel in the halftoned image to minimize noise generated during scanning (figure 6B and column 5, lines 16-22 of Crean), without constructing a new halftone center (figure 5 and column 4, lines 29-43 of Crean). The high-frequency dot growth pattern is used to provide a uniform change in darkness levels for the pixel (figures 6A-6B and column 5, lines 16-22 of Crean). As can clearly be seen in figure 5 of Crean, the progression of sub-pixels is from a

center outward (figure 5 and column 4, lines 39-43 of Crean). Thus, a new halftone center is not constructed.

Rao and Crean are combinable because they are from the same field of endeavor, namely the correction of image artifacts for scanned image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the sub-pixel dot progression for the halftone image, as taught by Crean, said halftone image being the second generation halftone image taught by Rao. The motivation for doing so would have been to ensure a uniform change in observed darkness per incremental increase in input level (column 5, lines 16-22 of Crean), thus preventing certain types of image noise. Therefore, it would have been obvious to combine Crean with Rao to obtain the invention as specified in claim 1.

6. Claims 2-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (US Patent 6,172,769 B1) in view of Crean (US Patent 6,643,032 B1) and Karlsson (US Patent 5,777,757).

**Regarding claims 2-3:** Rao in view of Crean does not disclose expressly determining a sub-pixel level difference; and that growing the dot pattern includes growing the dot pattern evenly across the second generation image by setting the sub-pixel level difference to one.

Karlsson discloses arranging a dot growth pattern (figures 5-7 of Karlsson) to offset initial dot growth from the center of the halftone cell by defining sub-cells and growing the dot pattern relative to the sub-cell (column 5, lines 50-52; column 6, lines 35-38; and column 7, lines 10-14 of Karlsson). The halftoning stages are performed with sub-cells that have a plurality of possible grayscale values (column 5, lines 52-55 of

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Karlsson). The first stage of growth cycles through all the grayscale values for the left column (figure 5 and column 5, lines 50-52 of Karlsson), the second stage of growth cycles through all the grayscale values for the middle column (figure 6 and column 6, lines 35-38 of Karlsson), and the final stage of growth cycles through all the grayscale values for the right column (figure 7 and column 7, lines 10-14 of Karlsson). Since the left column begins the growth of the halftone sub-cells (figure 5 and column 5, lines 50-52 of Karlsson), then said dot growth pattern is initially offset from the center of the overall halftone cell.

Karlsson further discloses growing the dot pattern evenly across the image by setting the sub-pixel level difference to one (figure 5; column 6, lines 5-11; and column 8, lines 52-62 of Karlsson). Karlsson teaches that the supercell array (figure 5(500) of Karlsson) can be configured in any desired manner and the order of growth can occur in any desired progression of stages (column 8, lines 52-62 of Karlsson). In the example of figure 5 of Karlsson, the order of growth progresses such that, in the left column, each sub-pixel is increased by one grayscale value until all the sub-pixels in the left column are the same value (column 5, line 63 to column 6, line 4 of Karlsson). Then, after all the sub-pixels of the left column have attained the same color, the growth progression repeats, but with the next grayscale level (column 6, lines 5-11 of Karlsson). Therefore, the sub-pixel level difference has been set to one. Since figures 5-7 of Karlsson are merely exemplary and any configuration and pixel growth can be defined (column 8, lines 52-62 of Karlsson), it would be obvious to one of ordinary skill in the art to apply the growth pattern of the left column of the



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supercell to the entire supercell. In other words, the progression would occur such that every sub-pixel in the supercell is the same grayscale value before a sub-pixel is set to the next grayscale value.

Rao in view of Crean is combinable with Karlsson because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the dot growth pattern taught by Karlsson to the second-generation halftone method taught by Rao. The motivation for doing so would have been to reduce image artifacts (column 3, lines 12-16 of Karlsson). Therefore, it would have been obvious to combine Karlsson with Rao in view of Crean to obtain the invention as specified in claims 2-3.

**Regarding claim 8:** Claim 8 comprises all of the limitations of claim 1-3, and is thus likewise rejected.

**Further regarding claims 4 and 11:** Karlsson discloses that said defining a sub-cell includes defining a cell to be a 4x4 pixel matrix (figure 10 and column 8, lines 35-38 of Karlsson). Karlsson further teaches defining a supercell (figure 9 of Karlsson) comprising four separate sub-cells as a 2D matrix (column 8, lines 25-32 of Karlsson), having a sub-pixel level difference matrix value for each pixel in the cell and sub-cell (column 8, lines 28-34 of Karlsson). Distributing the elements in the classes (column 8, lines 28-34 of Karlsson) determines how the dot pattern is grown (column 5, lines 10-17 of Karlsson). Splitting the supercell into four sub-cells (figure 9 and column 8, lines 25-29 of Karlsson) will result in four sub-cells of 2x2 pixels if performed on the supercell in the example of figure 10 of Karlsson). Further, since the supercell

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can be configured in any desired manner (column 8, lines 60-62 of Karlsson), the order of each of the sub-cells of figure 10 of Karlsson can be modified such that each 2x2 pixel sub-cell contains  $0_x$ ,  $1_x$ ,  $2_x$  and  $3_x$ , where 'x' is the integer denoting the order for the particular pixel.

**Regarding claims 5 and 12:** Rao discloses that said arranging includes scaling up the matrix values from zero to one, to zero to 255 (column 5, lines 56-59 and column 2, lines 37-38 of Rao). If the number of bits (B) is chosen (column 5, lines 56-59 of Rao) to be 8 (column 2, lines 37-38 of Rao), then the matrix values are scaled up from zero to one (1-bit halftone) to zero to 255 ( $2^8=256$ ).

**Regarding claims 6 and 9:** Rao discloses that the number of tone levels is fifteen levels of gray plus white (column 5, lines 56-59 and column 2, lines 37-38 of Rao). If the number of bits (B) is chosen (column 5, lines 56-59 of Rao) to be 4 (column 2, lines 37-38 of Rao), then the number of tone levels is fifteen levels of gray plus white ( $2^4=16$ ).

**Further regarding claims 7 and 10:** Karlsson discloses that the cell size is 4x4 pixels (figure 1 and column 4, lines 28-34 of Karlsson).

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**Conclusion**

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson  
Examiner  
Art Unit 2624

JAT  
14 June 2005



THOMAS D.  
~~THOMAS D.~~ LEE  
PRIMARY EXAMINER